

IN THE ABSTRACT:

A conjugate pair of intermeshing rotors having include helical lobes having helical crests and intervening grooves and are adapted for rotation about parallel axes within a working space of a screw rotor machine. Each rotor has a tip circle, a pitch circle, and a root circle. One, one rotor of each pair being is a female rotor formed such that the a major portion of each lobe of said the female rotor is located inside the pitch circle of the female rotor. The other rotor is a male rotor formed such that the a major portion of each lobe of said the male rotor is located outside said the pitch circle of the male rotor. The lobes of one rotor follow the grooves of the other rotor to form a continuous sealing line between said the pair of rotors. Each, each of the lobes having have a primary flank portion and a secondary flank portion. The, wherein the primary flank portion of said the lobes of the female rotor have a profile formed from at least one ellipse, and the primary flank portion of the lobes of the male rotor have a profile formed from at least one ellipses ellipse.